
To: NZSki Limited
Cc: Mitchell Daysh
From: Trudy Anderson and Carey Knox (Project Herpetologist)
Date: 27 August 2026
Subject: e3s 24135 – Remarkables Upgrade and Doolans Expansion Lizard Management Plan CODC Response

1 Purpose

CODC has provided a review of the Lizard Management Plan (LMP) in relation to the NZSki Limited Remarkables Ski Area and Doolans Expansion Project. This review was prepared by Wildlands Consulting (Report No: 7955b Date: July 2026). In this Memo, e3Scientific (e3s) and Southern Scales address the matters raised in the CODC review.

The CODC review points are provided in bold and the e3s and Southern Scales response is given thereafter. The Lizard Management Plan has also been updated both in response to these comments, and in response to the feedback given by the Department of Conservation.

2 Matters Discussed in CODC Feedback

2.1 Lizard Assessment and Management Plan

The LMP does not make reference to the DOC guidelines for lizard salvage (Department of Conservation, 2019). While the DOC guidelines have a misleading title (seemingly pertaining to salvage only), the document itself is useful to help practitioners develop a robust LMP which addresses all effects to indigenous lizards and assists practitioners to demonstrate protective benefit. There is no clear way to interpret this LMP without the use of these principles. Further it does

not appear that other standard technical guidance documents have been applied to this LMP, such as Department of Conservation 2023b and 2023a.

e3s do not believe that these documents need to be strictly adhered to. They are guidance documents that are helpful in many circumstances, but not in every circumstance. Southern Scales has not previously referred to them in the approximately 20 other LMPs they have produced. The objective of an LMP is to outline the best possible plan for indigenous lizards given the circumstances surrounding the development. There is further explanation of the rationale why salvage is not a suitable option for this project below and in the updated LMP.

2.2 LMP Comments

The plan does not provide clear objectives in line with the key principles of lizard salvage and transfer in New Zealand (2019). The LMP has made an attempt to determine the values of lizards present at the site. The LMP has attempted to identify the actual and potential effects of the project on indigenous lizards. The LMP does not clearly describe effects management and compensation for indigenous lizards at the site in a manner that no net loss will be achieved, which is inconsistent with the NPS-IB and the Wildlife Act (1953); DOC (2023a). There are several sections in the LMP where the author should expand on the reasoning for not completing a lizard salvage (Principle 5; DOC 2019), and how compensation actions are suitable to achieve no net loss for lizards within the Doolans, as outlined in DOC 2023a and under the NPS-IB and Wildlife Act (1953)).

The LMP has been updated in Section 2 to better describe the lizard values at the site. The Project Herpetologist considers that the effects management framework was not developed with lizards in mind and the application of the hierarchy (with compensation only being considered if none of the other options are feasible) does not produce the best outcomes for indigenous lizard fauna. The rationale for the lack of lizard salvage has been added to the updated LMP in section 4.4.1.

2.3 LMP Experience and Implementation

The LMP was reviewed by an experienced herpetologist with experience on Resource Management related Projects. However, the LMP was not prepared by a suitably qualified herpetologist, and there are no indications that the LMP will be implemented by suitably qualified herpetologists, as should be included in the LMP. It is unclear the experience of the ecologists who completed the surveys and their ability to survey for cryptic lizards (such as Lakes skink and orange-spotted gecko). Key roles and responsibilities are not set out in the LMP and it is unclear who will be implementing the plan and who will have authority to manage effects to lizards. Without certainty on personnel and roles and responsibilities, it is less

likely that the LMP will be implemented effectively and in a manner that reduces impacts to lizards.

e3s disagree that the LMP was not prepared by a suitably qualified herpetologist. Trudy Anderson (e3s) led the field work detailed in the Lizard Management Plan. The field survey methodology was developed alongside Dr Mandy Tocher from Lizard Expert NZ, who was the Lead Herpetologist, until heading overseas in April 2026. Following this, Carey Knox committed to being the lead herpetologist on this project during May 2026. Carey has 19 years of experience working on endemic lizards in the South Island. Trudy is also an experienced herpetologist. Section 1.7 of the LMP has been updated detailing this experience.

The survey was focussed on the best habitats available for possible rare lizards in the project area. These areas were thoroughly surveyed (both by trapping and hand-searching). e3s note that greater handsearching than depicted by the tracking detailed in the LMP was carried out. Not all searching while undertaking dedicated lizard work was tracked, and suitably experienced ecologists (both Ms Anderson and others) spent time in the project area undertaking non-lizard work where opportunistic lizard survey was also undertaken. Section 2.2 has been updated in the LMP.

Both Mr Knox and Ms Anderson have extensive survey experience with orange-spotted gecko and lakes skink, and are very aware of the habitats these species live in; Mr Knox has done over 40 survey days of work targeting orange-spotted gecko alone between 2015-2026. e3s are confident that any potential habitat for lakes skink or orange-spotted gecko in the 15.9 ha construction footprint (of which only 3.47 ha constitutes lizard habitat) would have been identified if present. This conclusion is clearly outlined in Table 3 and Section 3.2 of the LMP. Note the extent of lizard habitat in the earthworks footprint is only 3.47 ha, of which 3.22 ha is tussock grassland (the remainder being mostly *Dracophyllum* at 0.15 ha). The minimal habitat diversity, altitude, and aspect, are factors consistent with only McCann's skink habitat being present in the footprint. The revised LMP has updated the relevant sections to add clarity.

The LMP will be implemented by a suitably qualified and experienced herpetologist. The revised LMP has been updated to state this in Section 4.

There is potential habitat for rarer species in the wider nearby landscape (such as the boulderfields near Lake Alta) but these areas will not be impacted by the

proposed development or general running of the ski field activities relevant to the expansion.

3 Various Other Matters

3.1 Scope of Desktop Assessment

Desktop assessment overview

e3s assessed the potential herpetofauna values using a desktop assessment (Section 2.1, e3s LMP). It is not clear why a range has been used to determine likelihood and there is no reasoning provided in the LMP (i.e. low-moderate for any one species). Any species considered moderately likely should not be ruled out as not being present without further detail or reasoning in the LMP. DOC (2023a) provides guidance for assessing high value sites such as this (Table 1, DOC 2023a). If a species has a moderate chance of being present, this species should be assessed appropriately throughout the remainder of the LMP and contingencies provided for it in the LMP.

The Desktop Assessment was undertaken for the extended LMP site, rather than just the 3.47 ha project footprint. Obviously, these are different areas and have influenced the reviewers interpretation of species presence. In hindsight, the desktop assessment should have been done for the 3.47 ha area only, as that is the only lizard habitat that will be developed. The LMP has been updated to provide clarity (extra column in Table 1) and illustrated that it is very unlikely for species such as lakes skink and orange-spotted gecko to be in the earthworks footprint, given there is no rock habitat, and it is almost entirely tussock grassland.

Desktop assessments are described irrespective of the lizard survey undertaken on site, and the conclusions can change once this further knowledge is added. e3s and Southern Scales are both confident that McCann's skinks are the only species present and are only in approximately 3.47 ha of the 15.9 ha project footprint.

3.2 Rare/other lizard species

5.3.2 Potential lizard species

3.2.1 Nevis skink

Where Nevis skinks are present, they typically outcompete McCann's skinks and are abundant (e.g. in the Nevis Valley and Hector Mountains where it is not

uncommon to count 200-500 in a day; C. Knox, pers. obs.). They are a conspicuous and easy to detect species when they are present but have never been reported from the Remarkables Range proper.

3.2.2 Lakes skink

Lakes skink have never been found in the Remarkables, Nevis Valley, or Hector Mountains despite numerous surveys being undertaken in these mountain ranges and valleys. They occupy damp areas with complex rock cover, and these habitats are only minimally present in the project footprint (they are more common in the wider ski area). Please refer to the updated 2.2.2.1 section of the revised LMP. Hence, there is a chance they could still be discovered somewhere in the wider Remarkables or Hector Mountains in the future but are highly unlikely to turn up in the earthworks footprint.

3.3 Temperature recording

No records of temperatures have been provided across six survey “rounds” (LMP, Appendix 3). Therefore, there is no evidence of suitable conditions for surveys.

Weather data is detailed in Appendix 3 of the LMP. Further information has been added in Section 2.2.1.4 of the updated LMP.

3.4 McCanns skink population

Nor has any interpretation of the survey results been made to conclude how the estimate of 300-600 McCann's skinks will be killed or disturbed by the project been made. This estimate includes a large range and further detail should be provided which includes how this estimation has been made (Principle 2; DOC, 2019 and 2023a).

Please refer to updates in the revised LMP, Section 3.1 as follows:

The likely number of McCann's skinks affected by the Project is estimated to be 300-600 or 100-200 per hectare. This is a best guess based on the Project Herpetologist's experience with this species. It is not based on population modelling as it is considered difficult or impossible to accurately estimate the population size of this species in expansive tussock grassland habitats.

In addition, Mr Knox notes that several attempts at doing mark-recapture with McCann's skinks (to obtain estimated numbers) in tussock grassland at Macraes Flat have been unsuccessful due to high densities and low recapture rates.

3.5 Incidental Discovery Protocol

Incidental discovery protocols are standard for LMP's and help address threatened species discoveries, and any lizards found during operations (Principle 3 & 4 DOC, 2019). There are no keys provided or training/pre-start meetings required to induct contractors to know what lizards may be present. There is no documentation provided to assist contractors with adequately identifying a lizard (some small Oligosoma are difficult to distinguish between species). Therefore, it is unclear how incidentally discovered species will be reported, and how decisions will be made. It is not clear what to do with a McCann's skink if it has been discovered. There is no information regarding the relocation of incidentally discovered skinks.

The Lizard Management Plan as it stands does not require any NZSki staff or its contractors to undertake any lizard identification, as this is something only a suitably qualified Herpetologist should do. Instead, the Incidental Discovery Protocol (IDP) requires that any sighting or observation is discussed with the Project Herpetologist. An additional paragraph has been added to the LMP at the end of Section 4.5 to add clarification.

3.6 Indirect effects

No attempt has been made to improve upon the surrounding habitat for the displaced population. Therefore, it is inferred that the displacement of individuals is likely to be permanent.

e3s agree. Displacement will be permanent and the impact of the proposal on skinks present will also be permanent. The footprint is small (3.47 ha of the 15.9 ha earthworks footprint), plus the adjoining area that will be subject to indirect effects. The area impacted is a small proportion of the total amount of likely habitat for McCann's skinks in the Remarkables (>1,000 ha). There is some vegetation rehabilitation, however, e3S consider that the resources needed to improve any adjoining habitat for McCann's skink would be better deployed to the compensation described. A section has been added to the LMP (Section

4.4.5) detailing an additional action of creating rockpiles within the earthworks footprint adjoining undisturbed lizard habitat.

Residual impacts could be significant to indigenous lizards and their habitats if they are not managed effectively (DOC, 2023a). That is because there are likely to be residual impacts from more experimental mitigation methods such as habitat reduction than there are standard industry accepted methods (such as salvage).

e3s agrees there will be residual effects and considers these are addressed by the proposed compensation package. Section 4.4.2 of the LMP has been updated to more clearly reflect this.

3.7 Compensation

It is unclear how compensation of \$80,000 has been calculated, therefore it is not possible to consider whether this number is appropriate to compensate for the effects to this species.

The monetary value has been calculated based on how much it would cost to implement an eDNA project and support a MSc / PhD student at the University of Otago to complete the work with some supervision in the field from an experienced herpetological consultant (possibly Mr Knox , or another suitably experienced Herpetologist). The amount was estimated based on being an alternative to an ineffective lizard salvage and is sufficient to support the proposed project to its successful completion, noting the intent for it to be undertaken as a student project. The research project plan has subsequently been rationalised to be delivered on a smaller \$60,000 budget to allow \$20,000 to be repurposed to a translocation project following reviewer feedback. The intention is still to deliver a research project across 10 localities. The LMP has been updated in Section 4.7.

3.8 Outcome to the species or population effected

Further, it is unclear how funding eDNA research in alpine environments is going to provide protective benefit or the best ecological outcome to the species or population effected (Appendix 4; NPS-IB).

e3S agrees that the proposal does not provide a good outcome or benefit to the individual lizards impacted. As discussed above, the Project Herpetologist considers the effects management framework was not designed to provide a good outcome for lizards. The proposal is to redirect available funds to cryptic and threatened species for which there is limited information, rather than spending resources on a common, non-threatened species whose local abundance and distribution will only minimally be impacted by the proposal. This will provide better long term conservation outcomes for cryptic alpine skinks and geckos.

3.9 eDNA survey

eDNA swabs of survey equipment have not detected the presence of species within this genus, even though they have been present and using the equipment (pers. obs.). This is likely due to the frequency at which geckos shed their scales (which is typically in a single slough event true), how frequently they are active at any time (in an alpine zone this may be reduced to nights above 0 degrees; Knox et al., 2019), and how often they defecate. Due to their slow life histories, they are unlikely to shed much eDNA; much less than Oligosoma. Further, it appears that using eDNA to detect Threatened species has mixed results and is not effective for extremely Threatened species that use rock retreats (much like Mokopirirakau; Hoffman et al. 2025).

The Project Herpetologist is unaware of this data and is curious to know more about it. It is assumed that this involved swabbing of onduline retreats for forest geckos on Denniston Plateau. It could be that baited tracking tunnels are more effective than swabbing of onduline retreats for collecting eDNA from geckos. Also, it could be that a drier alpine environment works better than a wet one. There is still much that is not understood, and further research is warranted. Cassie Mealey's MSc research (and Reeves et al. 2025) showed large promise for skinks. Based on the CODC feedback, the LMP has been updated to balance the research more evenly between skinks and geckos e.g. also targeting species such as lakes skink. That would allow for adaptation depending on whether the tool shows more promise for alpine skinks or alpine geckos and, regardless, the results will be highly informative.

eDNA should have been a tool used at the survey stage if there was a confidence issue in detecting cryptic species.

e3s disagree, as the method is an untested tool in the alpine zone, hence the proposed research.

3.10 Survey scope

It is also unclear why the author of the LMP is proposing to survey sites within the LMP area, when they are confident in their assessment that Threatened or cryptic species are not present.

The Project Herpetologists are confident there are not cryptic species in the earthworks footprint. The research proposal is for the wider ski field area and beyond.

